

ABSTRACT OF THE DISCLOSURE

In a Maximum A posteriori Probability decoding (MAP decoding), a correlation and a deviation of noises for past and future states which depend on input signal patterns in past N bits and future Q bits are calculated by training by a noise correlation arithmetic operating unit 84 and they are stored. Upon reproduction, in a white noise arithmetic operating unit 91, white noise values for the past and future states in which colored noises are converted into white noises are obtained by using the stored correlation and deviation of the noises. In an input signal arithmetic operating unit 92, an input signal (channel information)  $\Lambda c(y_k|S_k^m)$  of the MAP decoding is calculated from the white noise values and the deviation for the past and future states. A likelihood in the MAP decoding is obtained from the input signal.

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